

AGGGAGAGTCTGCCCACAAGTTTTTGTATATTTTCTCACTGAGGCATCTATTAGTTTGGGCAGCAGACA
 CTGAGCAGAACGTAGCACGGCAATGCTTGGTAGCAATGCCTGTCCGGCCAGCACTCAGAAGACGGAGGCA
 GGAGAATCATAGCTTCCAGTCAGCCTCTTCTACAATATAGTCAGTTGGAAGTCAGCCAGCTTAGACAACA
 TGGAGAGCCTGTGCCGAAAGCCACTGGGTAAAGCCCGAATCTCAGTAGCAGAGAGCTGCCAGGGTGCCTA
 CTGC : AAAAAAAAAACCTCAAACAACAGAAGTAGGGAGGTGTAAAAATAAGTGTAGGGGGGTGGAATTTA
 AGCTGATGTGGACTTCCAAATAAAGTTACCTTTTAGATACCTATTTAAATCAATAGCATAGACCTGAAAC
 TGTCTATCAGAAAATGTGTCTATTCTGAGGAAGGAGTGCTAACGAGGTTCTGTGAGGGGGCCTCTGGCT
 TTGAGAGGGTGTACCATCACATAAGACTCCTAAAAGCACATACTTTTATAAATTCAACATGAGCTTTAAC
 ATCTTCTTTGTCAATTCGCAGACTGAGCCATGGAGTCTTTCGATGCTGACACCAATTCAACTGACCTACA
 CTCACGGCCTCTGTTTCAACCCCAAGACATTGCCTCCATGGTCATTCTTGGTCTCACTTGTCTATTGGGA
 CTGCTAGGCAATGGGCTGGTGTCTGTGGGTAGCTGGCGTAAAGATGAAGACGACCGTGAACACAGTCTGGT
 TCCTCCATCTCACCTGGCCGATTTCCTCTGCTGCCCTCTCCTTGCCCTTCTCCTTGGCTCACCTGATTCT
 CCAAGGACACTGGCCCTATGGCTTGTTCCTGTGCAAACTTATCCCATCCATCATTATTCTCAACATGTTT
 GCCAGTGTCTTCTGCTTACTGCCATTAGCCTGGACCGATGTCTGATAGTACATAAGCCAATCTGGTGCC
 AGAATCATCGAAACGTGAGAACCCTTCGCCATCTGTGGATGTGTCTGGGTGGTAGCCTTTGTGATGTG
 TGTGCCCGTATTTGTATACCGTGATCTGTTTCATTATGGACAATCGCAGTATATGTAGATATAATTTTGAT
 TCCTCCAGGTCAATGATTATTGGGACTACGTGTACAACTAAGTCTACCAGAAAGCAATTCTACTGATA
 ACTCCACTGCTCAGCTAACTGGACATATGAATGACAGGTGAGCTCCTTCTGTACAGGCAAGGGATTA
 CTTTTGGACAGTTACCACTGCCCTCCAGTCACAGCCATTCTTAACATCTCCTGAAGACTCATTCTCTCTA
 GATTTCAGCAAACCAACAACCCCATTTATGGTGGAAAGCCTCCTAATGTCTCTCACAGCCGCCGTACCCAGCG
 GGTTTTCTGTTGAAGATCGTAAATCCAATACACTGAACGCTGACGCTTTTCTCTCTGCTCACACAGAACT
 TTTCCCTACTGCTTCTAGTGGTCATTTATACCCCTATGATTTCCAGGGGGATTATGTTGACCAATTCACG
 TATGACAATCATGTGCCGACACCGCTGATGGCAATAACCATCACAAAGGCTGGTGGTGGGCTTCTGGTGC
 CGTTTTTCATCATGGTAATTTGTTACAGCCTCATCGTCTTCAGAATGCGAAAAACCACTTCACCAAGTC
 TCGGAACAAAACCTTTCCGGGTGGCTGTGGCTGTGGTCACTGTCTTTTTTATCTGCTGGACTCCATACCAT
 CTTGTGCGGAGTCTGCTATTGATTACTGATCCAGAAAGTTCCTTGGGGGAAGCTGTGATGTCTGGGACC
 ACATGTCCATTGCTTTAGCATCTGCCAATAGTTGCTTCAACCCCTTCTCTGTATGCCCTCTTGGGGAAAGA
 CTTTtaggaagaaagcaagacagtcctataaagggcattctggaagcagccttcagcgaagagctcacgcac
 TCTACCAACTGTACCCAAGACAAAGCCTCTTCAAAAAGAAACAATATGAGTACAGATGTGTGAAGATGTG
 GCCCTGGGAACCTAAGCAGAGTCTCAGGTGAACAGTGATGGATGACATGTGAGCAGGACACTTTAGACA
 ATTTGGCGACTCTCAGAGAAAGGTCTCTTATTGACATCAGCATCATTGAAAAACATTAAAGATGCAAAAT
 TTCAAGCCCCATCCCAGATGTGTTGACTCAGAATCTCTGGCCCATGGGACCAGTGTTTTTAACAGGCCTTC
 TTGTTTCCATCAGTGTTAAGTTTTACCTCATTGGCTTAGTCTATTCCCATCCCTGACTACACCATGTGC
 AATGAATAACTTTTTTCATCTGTTTTTCAGTATTCTTTTTTTTCTTAGCATCATCTAAACTTCTAGTTTG
 CATGGAAGGCTGCTCTTATTGTTCTGAATGGAAGATATTCATTATTGTACAGTTTTGTGGTGGTGACAA
 GTGATTTTTAAGTGGGGAAGAGACACAGTAAGAAAAGATCTATGAAAGCAGGGAGTGTGAGTTAGAGT
 TTGACAGAACACAGTGCCAAATGCCACCCACTAAAAGCAACCTGAGATAATTCCAGTGTTTCATGTGAGCA
 AGTGAGCACAGATACATAAACACTTTCCTACTCTGGAGTGTTTTAGAAAGTTGTAGCTTGGAGCTC

(SEQ ID NO:1)

MESFDADTNSTDLHSRPLFQPQDIASMVILGLTCLLGLLGNGLVLWWAGVKMKTTVNTVWFLHLTLADFLCC
 LSLPFLAHLILQGHWPYGLFLCKLIPSIILNMFASVLLTAISLDRCLIVHKPIWCQNHRNVRTAFAICGCVWV
 VAFVMCVPVFVYRDLFIMDNRSICRYNFDSSRSYDYWDYVYKLSLPESNSTDNSTAQLTGHMNDRSAPSSV
 QARDYFWTVTTALQSQPFLTSPEDSFSLDSANQQPHYGGKPPNVLTAAVPSGFPVEDRKSNTLNADAFLSA
 HTELFPTASSGHLYPYDFQGDYVDQFTYDNHVPTPLMAITITRLVVGFLVPFFIMVICYSLIVFRMRKTNFTKS
 RNKTRFVAVAVVTFFICWTPYHLVGVLLLITDPESSLGEAVMSWDHMSIALASANSFCNPFYALLGKDFRK
 KARQSIKGILEAAFSEELTHSTNCTQDKASSKRNNMSTDV (SEQ ID NO:2)

FIGURE 1

underlined = deleted in the targeting construct (SEQ ID NO:5)

[] = sequence flanking Neo insert in targeting construct (SEQ ID NO:6 and SEQ ID NO:7)

AGGGAGAGTCTGCCCACAAGTTTTTGTATATTTTCTCACTGAGGCATCTATTTCAGTTTGG
GCAGCAGACACTGAGCAGAACGTAGCACGGCAATGCTTGGTAGCAATGCCTGTCCGGCCA
GCACTCAGAAGACGGAGGCAGGAGAATCATAGCTTCCAGTCAGCCTCTTCTACAATATAG
TCAGTTGGAAGTCAGCCAGCTTAGACAACATGGAGAGCCTGT [GCCGAAAGCCACTGGGT
AAGCCCGAATCTCAGTAGCAGAGAGCTGCCAGGGTGCGTACTGCAAAAAAAAAAACCTC
AAACAACAGAAGTAGGGAGGTGTAAATATAAGTGTAGGGGGGTGGAATTTAAGCTGATGT
GGACTTCCAAATAAAGTTACCTTTTAGATACCTATTTAAATCAATAGCATAGACCTGAAA
CTGTCTATCAGAAAATGTGTCTATTCTGAGGAAGGAGTGCTAACGAGGTTCTGTGAGGGG
GGCCTCTGGCTTTGAGAGGGTGTACCATCACATAAGACTCCTAAAAACACATACTTTTAT
AAATTCACCATGAGCTTTAACATCTTCTTTGTCAATTCGCAGACTGAGCCATGGAGTCTT
TCGATGCTGACACCAATTCAACTGACCTACACTCACGGCCTCTGTTTCAACCCCAAGACA
TTG] CCTCCATGGTCATTCTTGGTCTCACTTGTCTATTGGGACTGCTAGGCAATGGGCTG
GTGCTGTGGGTAGCTGGCGTAAAGATGAAGACGACCGTGAACACAGTCTGGTTCCTCCAT
CTCACCTGGCCGATTTCTCTGCTGCCTCTCCTTGCCCTTCTCCTTGCTCACCTGATT
CTCCAAGGACACTGGCCCTAT [GGCTTGTTCCTGTGCAAACTTATCCCATCCATCATTAT
TCTCAACATGTTTGCCAGTGTCTTCTGCTTACTGCCATTAGCCTGGACCGATGCTGAT
AGTACATAAGCCAATCTGGTGCCAGAATCATCGAAACGTGAGAACCGCCTTCGCCATCTG
TGGATGTGTCTGGGTGGTAGCCTTTGTGATGTGTGTGCCCGTATTTGTATACCGTGATCT
GTTCAATTATGGACAATCGCAGTATATGTAGATATAATTTTGATTCTCCAGGTCATATGA
TTATTGGGACTACGTGT] ACAAACTAAGTCTACCAGAAAGCAATTCTACTGATAACTCCA
CTGCTCAGCTAACTGGACATATGAATGACAGGTCAGCTCCTTCTCTGTACAGGCAAGGG
ATTACTTTTGGACAGTTACCACTGCCCTCCAGTCACAGCCATTCTTAACATCTCCTGAAG
ACTCATTCTCTCTAGATTACAGCAAACCAACAACCCCATTTATGGTGGAAAGCCTCCTAATG
TCCTCACAGCCGCCGTACCCAGCGGGTTTCTCTGTTGAAGATCGTAAATCCAATACACTGA
ACGCTGACGCTTTTCTCTCTGCTCACACAGAACTTTTCCCTACTGCTTCTAGTGGTCATT
TATACCCCTATGATTTCCAGGGGGATTATGTTGACCAATTCACGTATGACAATCATGTGC
CGACACCGCTGATGGCAATAACCATCACAAAGGCTGGTGGTGGGCTTCTTGGTGCCGTTTT
TCATCATGGTAATTTGTTACAGCCTCATCGTCTTCAGAATGCGAAAAACCAACTTCACCA
AGTCTCGGAACAAAACCTTTCCGGTGGCTGTGGCTGTGGTCACTGTCTTTTTTATCTGCT
GGACTCCATACCATCTTGTCCGAGTCCGTCTATTGATTACTGATCCAGAAAGTTCCTTGG
GGGAAGCTGTGATGTCTTGGGACCACATGTCCATTGCTTTAGCATCTGCCAATAGTTGCT
TCAACCTTTTCTGTATGCCCTCTTGGGGAAGACTTTAGGAAGAAAGCAAGACAGTCTA
TAAAGGGCATTCTGGAAGCAGCCTTCAGCGAAGAGCTCACGCACTCTACCAACTGTACCC
AAGACAAAGCCTCTTCAAAAAGAAACAATATGAGTACAGATGTGTGAAGATGTGGCCCTG
GGAACCTAAGCAGAGTTCTCAGGTGAACAGTGATGGATGACATGTGAGCAGGACACTTTA
GACAATTTGGCGACTCTCAGAGAAAGGTCTCTTATTGACATCAGCATCATTTGAAAACAT
TAAAGATGCAAAATTTCAAGCCCCATCCCAGATGTGTGACTCAGAATCTCTGGCCCATG
GGACCAGTGTTTTAACAGGCCTTCTTGTTCATCAGTGTAAAGTTTACCTCATTTGGC
TTAGTCTATTCCCATCCCTGACTACACCATGTGCAATGAATAACTTTTTTCATCTGTTTTC
AGTATTCTTTTTTTTTTCTTAGCATCATCTAACTTCTAGTTTGCATGGAAGGCTGCTCT
TATTGTTCTGAATGGAAGATATTCATTTATTGTACAGTTTGTGGTGGTGACAAGTGATT
TTTAAGTGGGGAAGAGACACAGTAAGAAAAGATCTATGAAAGCAGGGAGTGTGAGTTA
GAGTTTGACAGAACACAGTGCCAAATGCCACCCACTAAAAGCAACCTGAGATAATTCCAG
TGTTTCATGTGAGCAAGTGAGCACAGATACACATAAACACTTCTCTACTCCTGGAGTGTTT
TAGAAGTTGTAGCTTGGAGCTC

FIGURE 2A

Gene Sequence Structure *

663 bp

Sequence Deleted

859 bp

Size of full-length
cDNA: 2658 bp



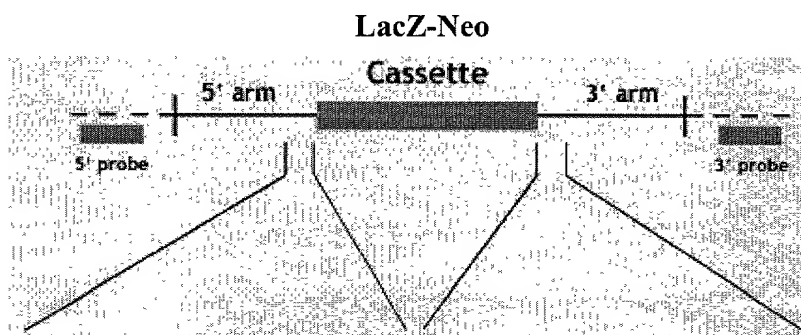
Targeting Vector* (genomic sequence)

Construct Number: 3036

Arm Length:

5': 3.2 kb

3': 1.8 kb



* Not drawn to scale

5' >CGAGGTTCTGTGAGGGGGGCC
TCTGGCTTTGAGAGGGTGTACCAT
CACATAAGACTCCTAAAAGCACAT
ACTTTTATAAAATTCACCATGAGCT
TTAACATCTTCTTTGTCATTTCGC
AGACTGAGCCATGGAGTCTTTCGA
TGCTGACACCAATTCAACTGACCT
ACACTCACGGCCTCTGTTTCAACC
CCAAGACATTG<3'
(SEQ ID NO:3)

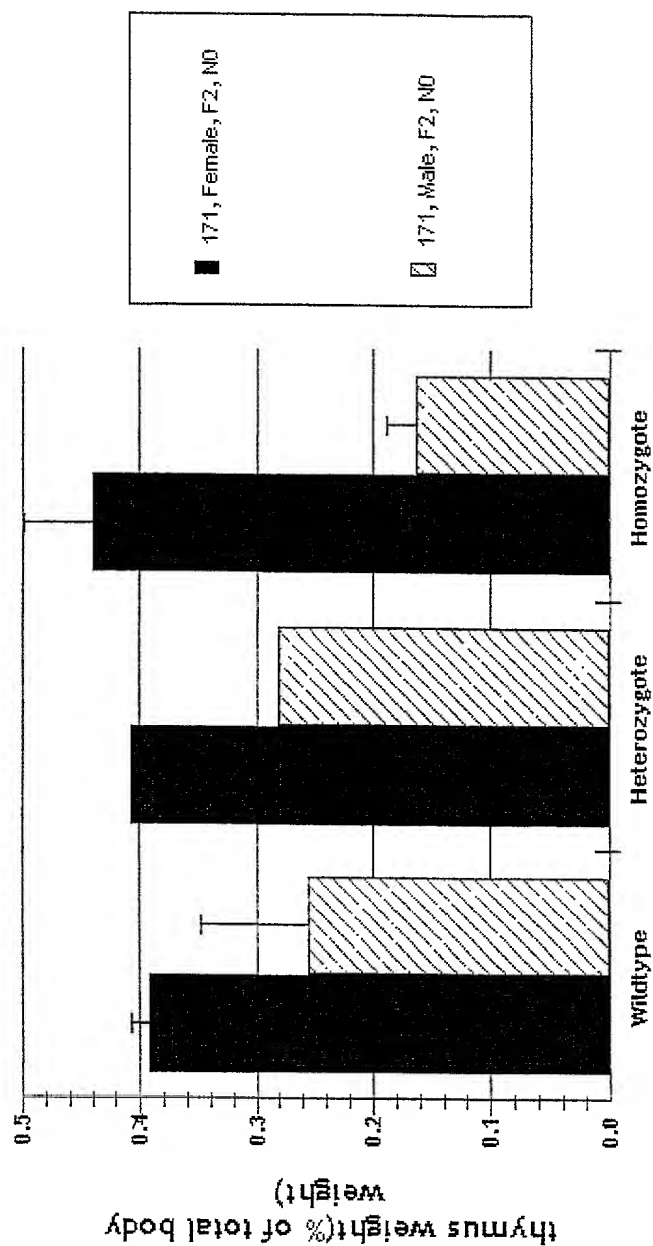
5' >GGCTTGTTCTGTGCAAACCTT
ATCCCATCCATCATTATTCTCAAC
ATGTTTGCCAGTGTCTTCCTGCTT
ACTGCCATTAGCCTGGACCGATGT
CTGATAGTACATAAGCCAATCTGG
TGCCAGAATCATCGAAACGTGAGA
ACCGCCTTCGCCATCTGTGGATGT
GTCTGGGTGGTAGCCTTTGTGATG
TGTGTGCCCCGT<3'
(SEQ ID NO:4)

FIGURE 2B

2000-03-26-00

4/4

necropsy - thymus weight/body weight



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FIGURE 3